SOUTHERN SIERRA GEOGRAPHIC INFORMATION COOPERATIVE

FIRE & FUELS DATA MANAGEMENT WORKSHOP

VERSION: FINAL

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WORKSHOP SUMMARY PRODUCED BY:

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1 PROJECT BACKGROUND

Within the Southern Sierra Nevada, data development and management practices for critical fire-related data is independently collected and managed separately, by the local Agencies. This includes fuels and fuels inventory related data (fuel model, canopy, crown bulk density, tree height, historic fire regimes, and height-to-live) and monitoring data (e.g. fire effects, fire inventory analysis). Additionally, there are few local standards or protocols for managing temporal and spatial changes to dynamic fuels data. These fragmented business models are problematic and result in duplication of work (or not being done at all) and an inability to easily acquire and utilize data from different sources. Further, applying this data across landscapes and different agency jurisdictions is difficult and inefficient because of laissez-faire data management practices; agencies are less likely to acquire and use neighbor agency data to improve information quality within or external to their boundaries. Acquisition and sharing of data across agency boundaries ranges from difficult to nearly impossible.

BusinessGenetics was asked to support and facilitate business co-formulation and graphical articulation of both current local agency business practices / processes and a proposed, collaborative future business practice / process to support the collection and management of Fire and Fuels data.

2 WORKSHOP AGENDA

Pat Lineback, of the National Park Service and member of the SSGIC established the initial workshop agenda. During the course of the workshop, group discussion focus changed which required dynamic adjustment to remaining workshop activities.

The initial workshop was established as follows:

1. Introduction / Logistics
2. Overview of the BG Methods
3. For Each Agency define:
   - Mission
   - Fire Related Objectives
   - Identify Overlaps
4. Define "Local" Business Process
   - Inventory / Monitoring / Analyses
   - Software / Models / Monitoring Methods
5. Rank Software / Models / Monitoring Methods
   - Short-term (< 2-years)
   - Long-term (> 2-years)
6. Rank Software / Models / Monitoring Methods (Low / Medium / High)
7. Define "Local" Information Needs
   - Agency
   - Systems
   - Overlaps
8. Agree on NB Applications / Input Data
9. ID Opportunities for Shared Fire Related Data Collection Management
   - Who / Where / When / What / How
10. ID Short / Long-term Paradigms for Improving Quality of Seamless Fuels Data with SSGIC

3 WORKSHOP DELIVERABLES

3.1 Mission and Fire Related Objectives

Agency ***Mission*** and ***Fire Related Objectives*** for each Agency represented were captured. (See Table 1 below).

Table 1: Primary Mission and Fire Related Objectives

	National Park Service (NPS) – public lands	**Forest Service (FS) – public lands**	**Bureau of Land Mgmt. – public lands**	**Kern County – private lands**	**Cal. Dept. of Forestry (state & private)**
Primary Mission	Protect and preserve the natural and cultural resources for the enjoyment of future generations	Multiple use of natural resources; sustained yield; caring for the land and serving people	Multiple use mgmt. Using cooperative partnerships; maintaining health and diversity of the land	Protect and preserve life and property	Protect and preserve life and property; managing sustained yield
Fire Related Objectives	1. Protect and restore the park's ecological, cultural and social values 2. Reduce fire hazards in the park's ecosystems 3. Reduce risk of unwanted wildland fire	1. Protect firefighter (safety) and human life, resources and property 2. Protecting and enhancing habitats, ecosystems, watersheds, & communities	1. Protection of life, property and natural/cultural resources 2. Integration of fire to help ecosystems regain their natural fire regime 3. Prevent unwanted wildland fire	1. Suppress fire 2. Prevent fire 3. Prevent damage to ecosystems 4. Reduce resource damage risk 5. Increase production on rangelands (rangeland and subdivision burning)	1. Reduce losses from fire 2. Reduce costs from fire 3. Improve habitat 4. Improve natural resource 5. Improve land use

It was also determined that each Agency shared higher-level ***Fire Related Objectives.*** They were captured as follows:

Table 2: Shared Federal and State Objectives

Shared Federal Objectives	– Protect firefighter (safety) and human life, resources and property – Integration of fire as a change agent in the mgmt. of fire dependent ecosystems to sustain biological diversity – Provide for smoke mgmt.
Shared State Objectives	– Protect and enhance the forest and rangeland resources of CA – Protecting stakeholders and investments – Reduce costs and losses of wildfires – County – Suppress fire and prevent fire – Provide for smoke mgmt.

3.2 Local Agency Business Processes

A high-level "As-is" Business Activity Model was produced to represent the activities performed by the NPS in support of their defined **Fire Related Objectives.** It was then further determined that all Agencies represented shared the same model. The primary difference between the Agencies in performing these identified activities was degree of formality.

The resulting combined high-level business model is presented on the next page (see Figures 1 through 3).

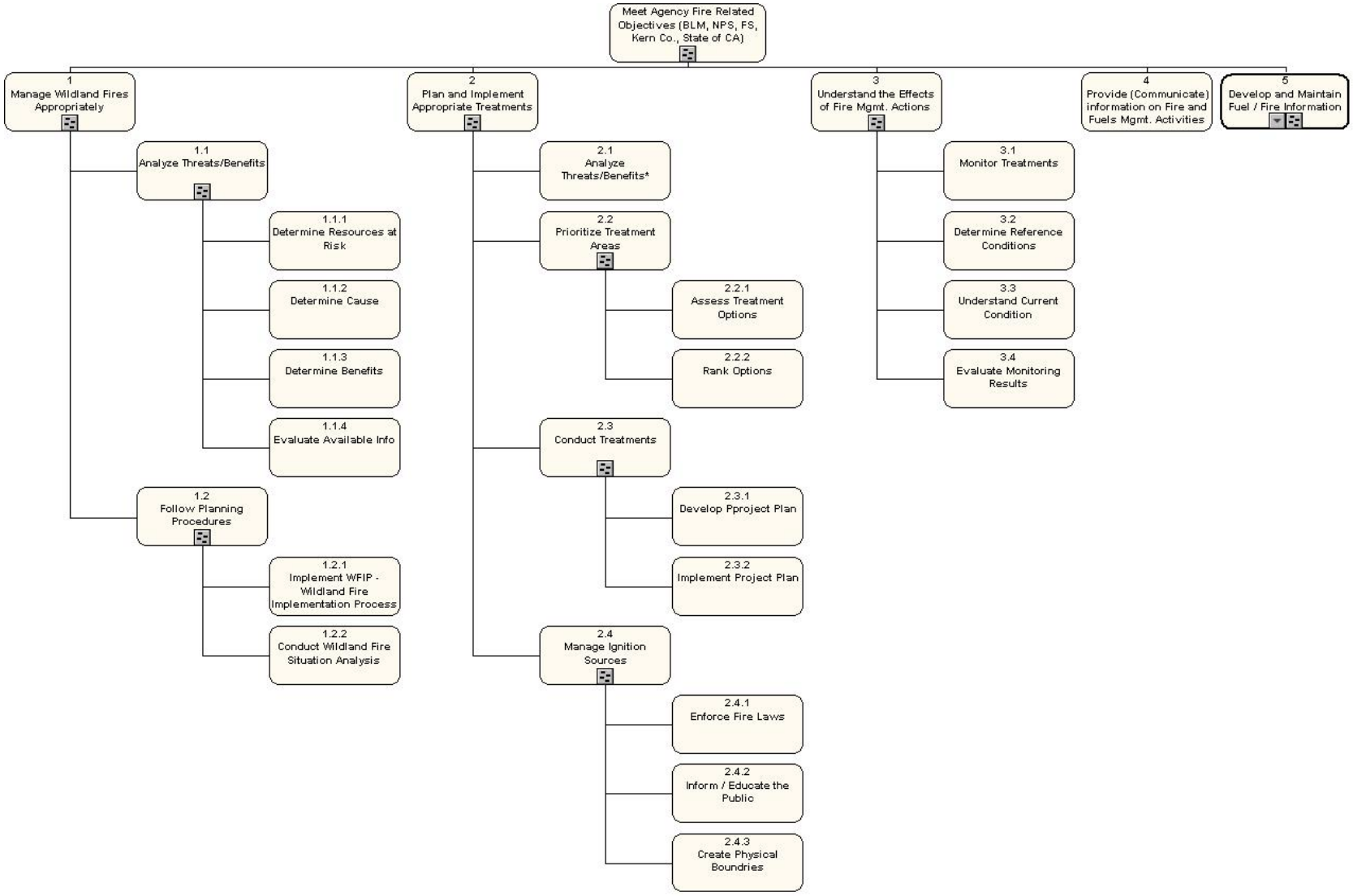

Figure 1 – High-level Business Activity Mode for all represented Agencies (Model 1 – Meet Agency Fire Related Objectives)

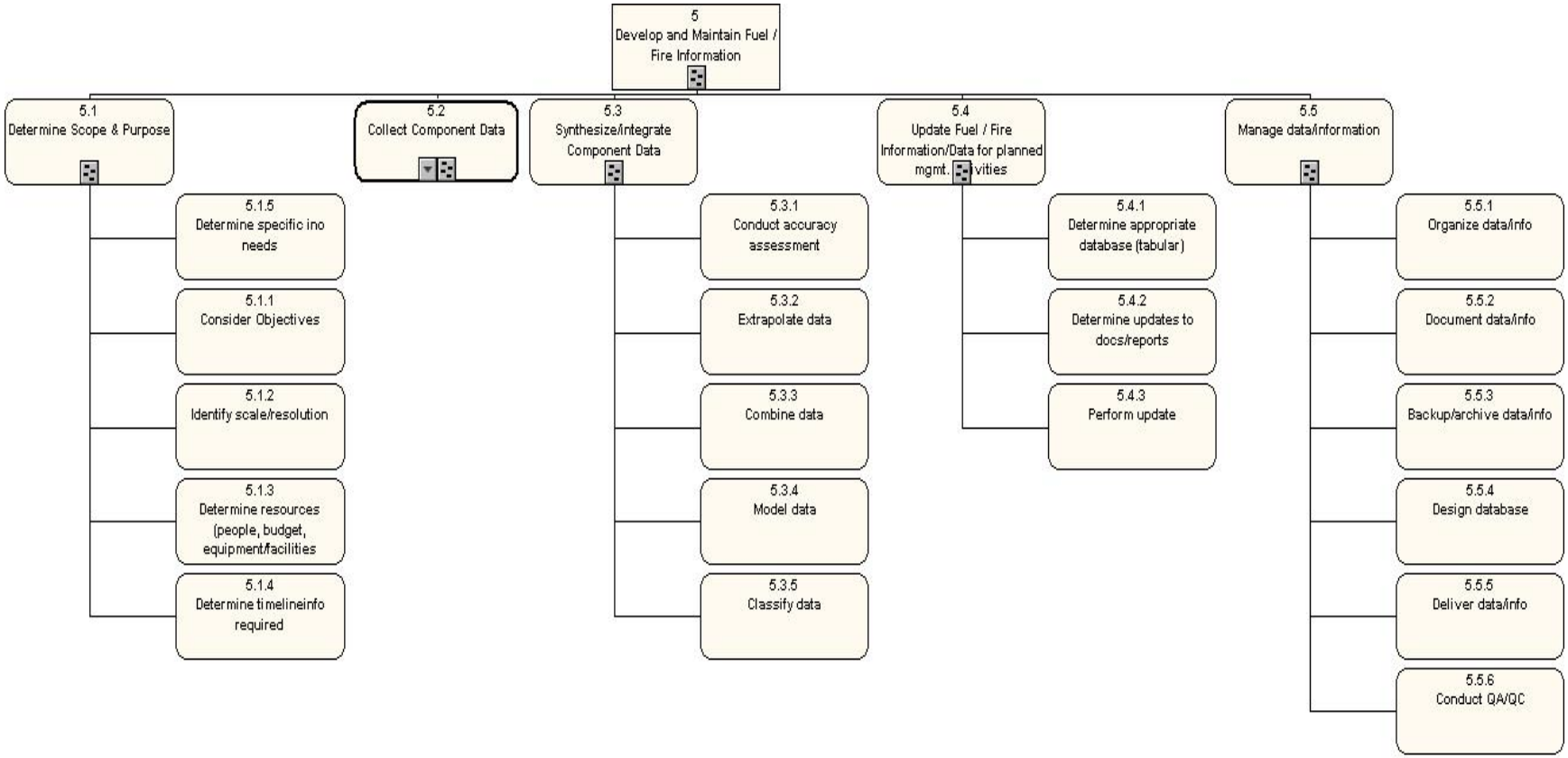

Figure 2 – High-level Business Activity Mode for all represented Agencies (Model 2 - Develop and Maintain Fuel & Fire Information)

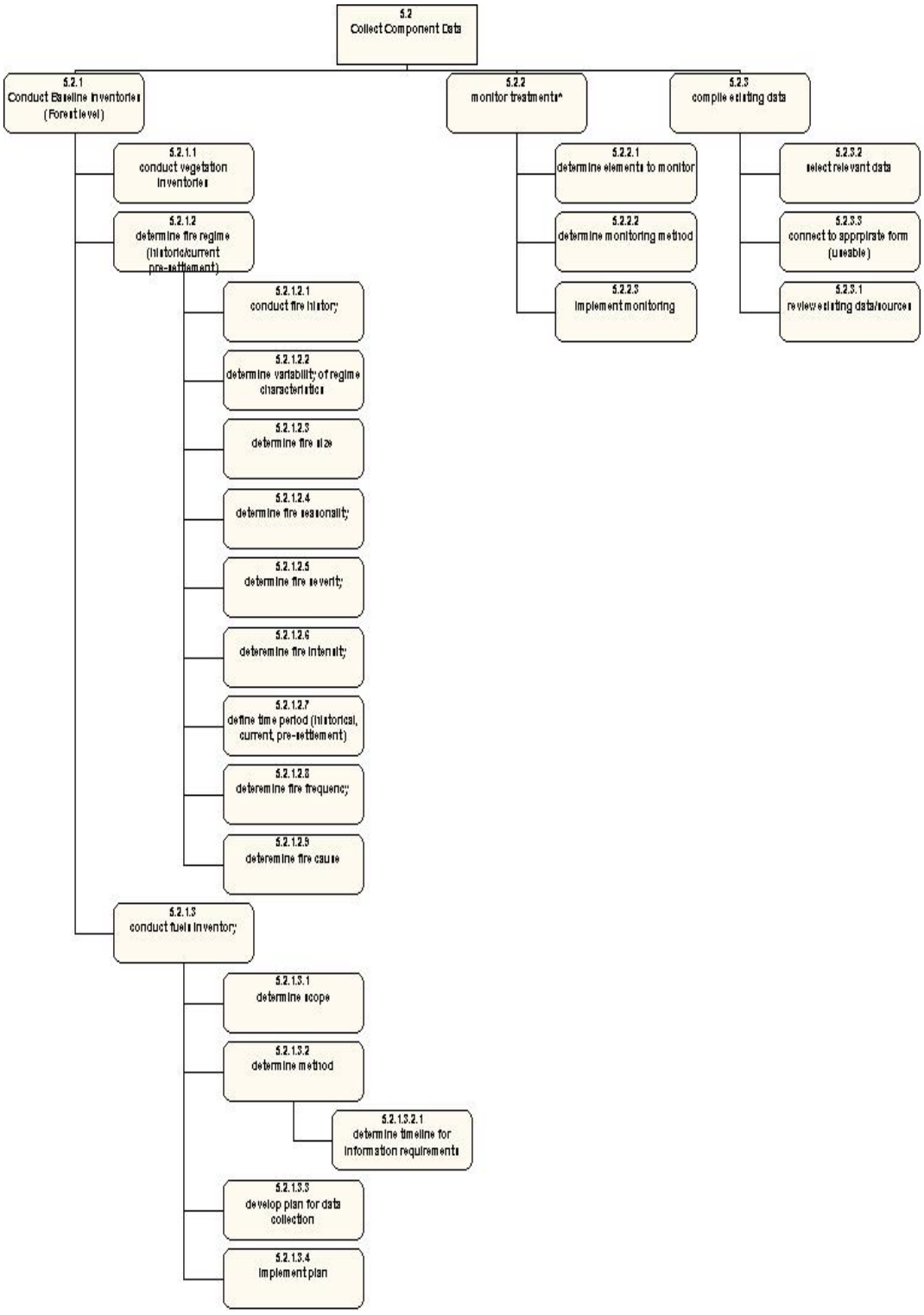

Figure 3 – High-level Business Activity Mode for all represented Agencies (Model 3 – Collect Component Data)

3.3 Predictions

Remaining workshop activities provided for discussion on Predictions. To time-box this discussion – four predictions were identified with focus on: definition, measurement criteria, prediction model, and data requirements. This information was captured for both a current state and proposed future state, on predicting HAZARD, IGNITIONS, VALUE and RISK. (See Tables 3 through 6.)

Table 3: Predict HAZARD

Predict HAZARD	Definition	Measured By (Output)	Model	Data Requirements
Current State	Physical situation that has potential to cause harm Intent: to show change; compare over time	Rate of Spread (Visible)	FLAMMAP Fire Family Plus Nexus	Aspect Slope Elevation Fuel Model Canopy Cover Height to Live Crown Tree Height Crown Bulk Density Weather / Wind Fuel moisture, wind speed, sort by spread component Fire Family Plus - humidity and air temps; feeds FLAMMAP fuel moisture
Proposed Options	Something that is a danger Rate of Spread (Indicator)	Flame Length (Visible) Energy Release / Intensity "Outside the Box" of tool selected	NEXUS FIREHARM	Weather

Additional discussion points / suggestions captured relating to predicating HAZARD:

- Use a full 4-tier of weather in FLAMMAP in order to generate crown behavior. Crown measurement/indices are emphasized in the National Fire Plan
- Need to look at the three outputs separately. Make a note when crown fire info is used. FLAMMAP doesn't do potential hazard to trees.
- Go back and look at measures that may be beneficial for predicting hazard.
- Holling chart is classification of threshold - what are the thresholds for deciding which is low, which is med., which is high. Scale used on map is 0-4, 4-8, 8-11, >11.
- FIREHARM; is a new modeling tool to predict fire danger, smoke and morality, available in 6 months.
- NEXUS; designed to deal with crown fire question and is available now.

Table 4: Predict Ignitions

Predict Ignitions	Definition	Measured By (Output)	Model	Data Requirements
Current State	Ignition occurrence	Ignitions per 1000 acres per year	FOA	Ignition Points Location, date, time and cause
Proposed Options				

Additional discussion points / suggestions captured relating to predicating IGNITIONS:

- Use human and lightning as threshold / classification
- WFSI; is a program to determine loss

Table 5: Predict Value

Predict VALUE	Definition	Measured By (Output)	Model	Data Requirements
Current State				
Ecological	The worth of "something"	Fire Return Interval Departure (FRID)	FRID	Vegetation Classification Fire Perimeters Historic Fire Return Intervals
Social / Economic		As defined by need of Agency	Multi-criteria Asset Analyzer	Fire Fighter Safety - Roads - Topography - Slope - Aspect - Elevation - Fuel Model Hydro Power Plants Soils Ranking Range Ranking Structures Water Supply
Proposed Options		$$ $$ Equivalents Ecological Value Emotional Value		

Need Prioritization consistent with list of important issues

Table 6: Predict Risks

Predict RISK	Definition	Measured By (Output)	Model	Data Requirements
Current State	***Probability of an unwanted event***	WFSI; hazard, ignition (wanted, unwanted); purpose > consider filtering data	FRID	Outputs of WFSI and ASSET ANALYZER
Proposed Options	Expected value of loss	$$ Equiv. per acre per year (output of asset analyzer)		

Remaining discussion focused on data issues around the need to link between vegetation and fuel layer. Each of the agencies represented identified related available sources of Veg. information.

NPS – Veg. classification (outdated), less than Cal. Veg. in quality; aerial photos
FS & CDF – Cal. Veg.. (FS/CDF)Classification; Interagency; FIA data; 2 ½ acres clustered
BLM – Cal. Veg.; WHR (multi-stand); crosswalk; uses own classification system
Kern – CDF provides info;

The SSGIC is using national standards. Goal is to get one layer consistent across area; 30 m resolution (Imagery comes in at 30 m).

Issues/challenges

1. Ecological inventory map (standard different in different forest); classification is NVCS (association level)
2. Different mapping standards
3. Different classifications
4. Different currency of data sets (age, outdated)
5. Accuracy Veg. Map not always sufficient for Veg. to fuel crosswalks… depends on the quality of plot data
6. Can't rely on Veg. Map changing in next 3 years --single view of cal. Veg. except where GAP
7. Need to determine how to use existing data when not from same source

8. Accuracy of data at particular resolution is questionable

Proposed Approach on how to pull together disparate data:

1. Select 'best' coarse level --map as baseline
2. Use fine scale to view detail
3. Produce fuels map from TM data – skip vet, data
4. WHR -- crosswalk to fuel models
5. To get good fuels map, there needs to be good plot data

Other Source of Veg. Info – satellite, Veg. maps;
For wildlife – Gap + WHR

MAIN ISSUE:
On crosswalk from Veg, to fuels, losing detail. Need to revise the crosswalks. Source data = interagency cal data and GAP; fix it by air photos or patch in some kind of landmark using old mapping for forest plans - need to match ortho-quads with polygons to be sure that the labels are correct

To re-do the crosswalk, the following process was defined: The following processes were documented to reflect the activities to be performed, the information either needed or produced and who should be responsible for performing the activity. All these activities were targeted for completion by September 1, 2002. (Please figures 4 through 7.)

Development of these models concluded the worksession.

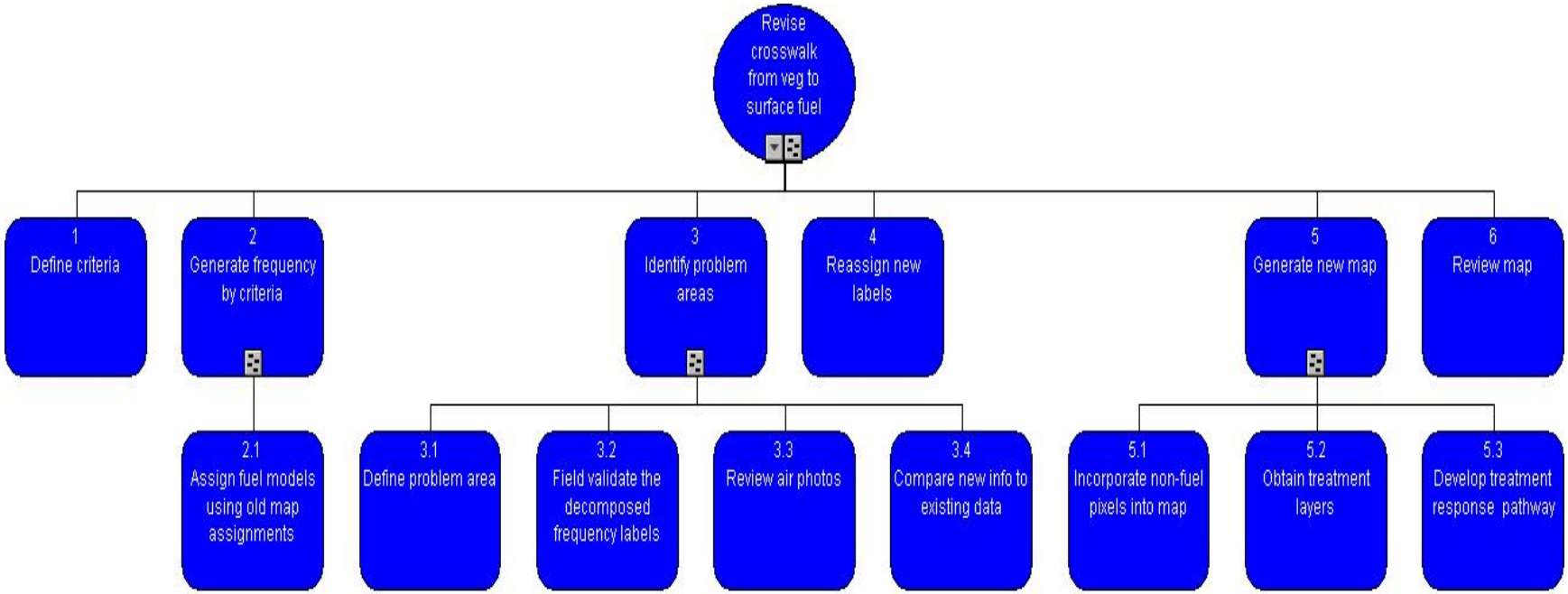

Figure 4 – Proposed High-level Business Activity Model for Revising the Veg – Fuel Cross Walk

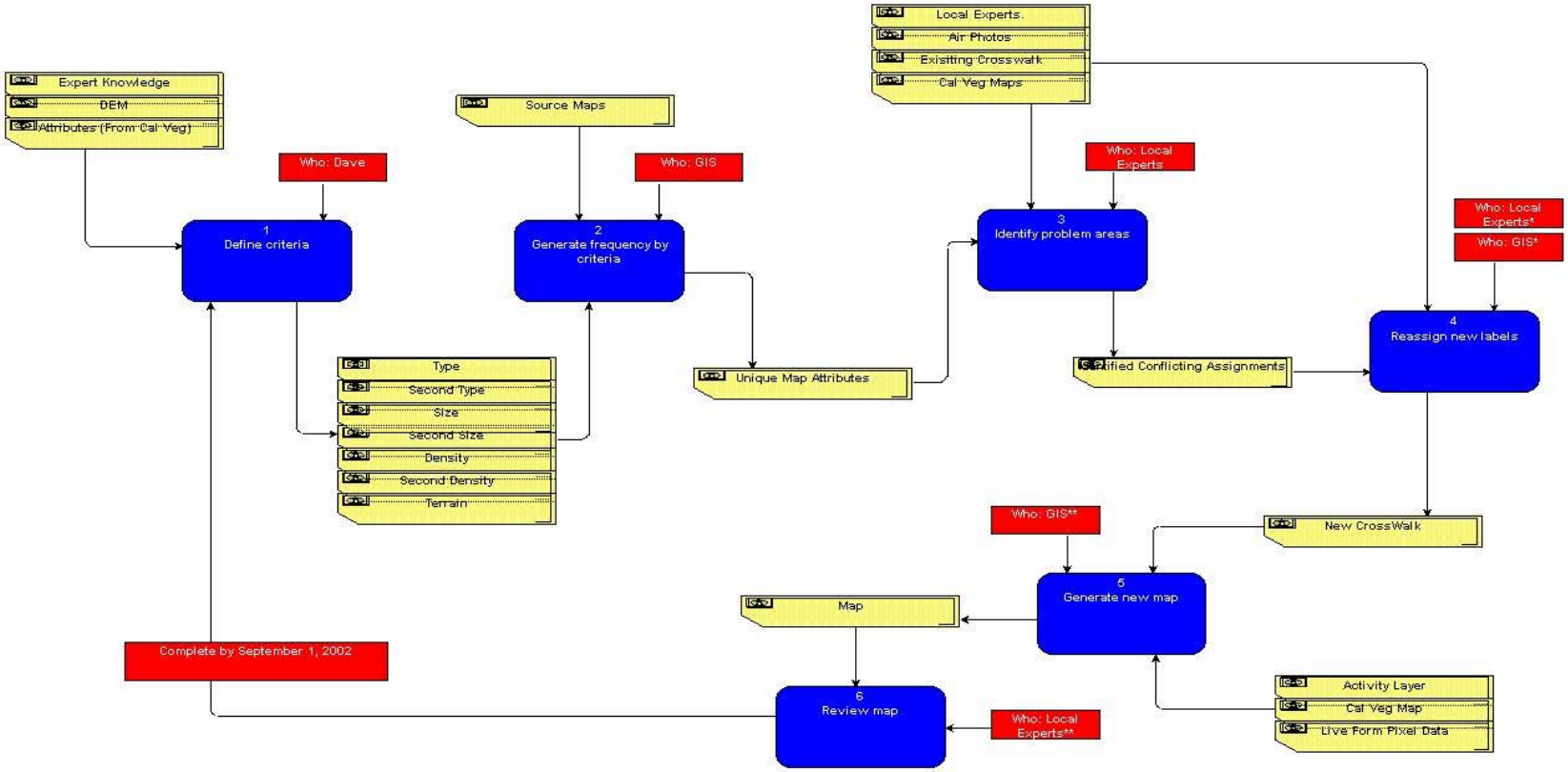

Figure 5 – Proposed High-level Business Process Flow Model for Revising the Veg – Fuel Cross Walk

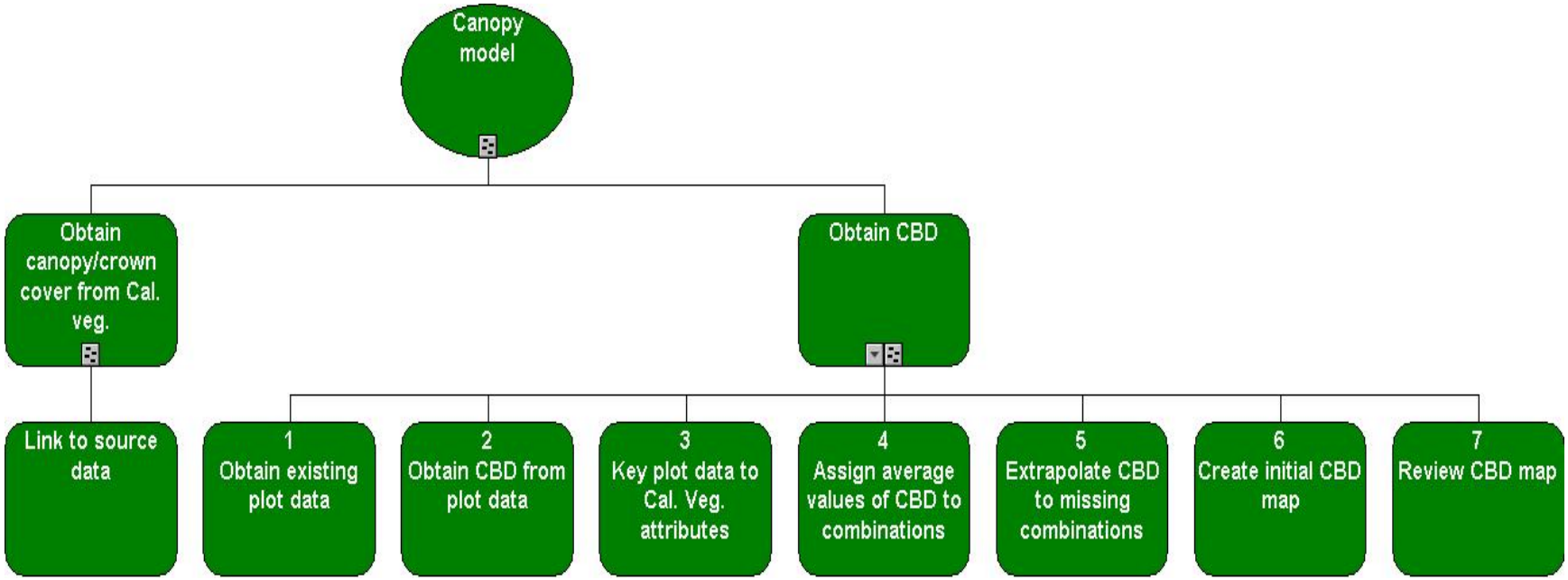

Figure 6 – Proposed High-level Business Activity Model for Revising Canopy Fuel

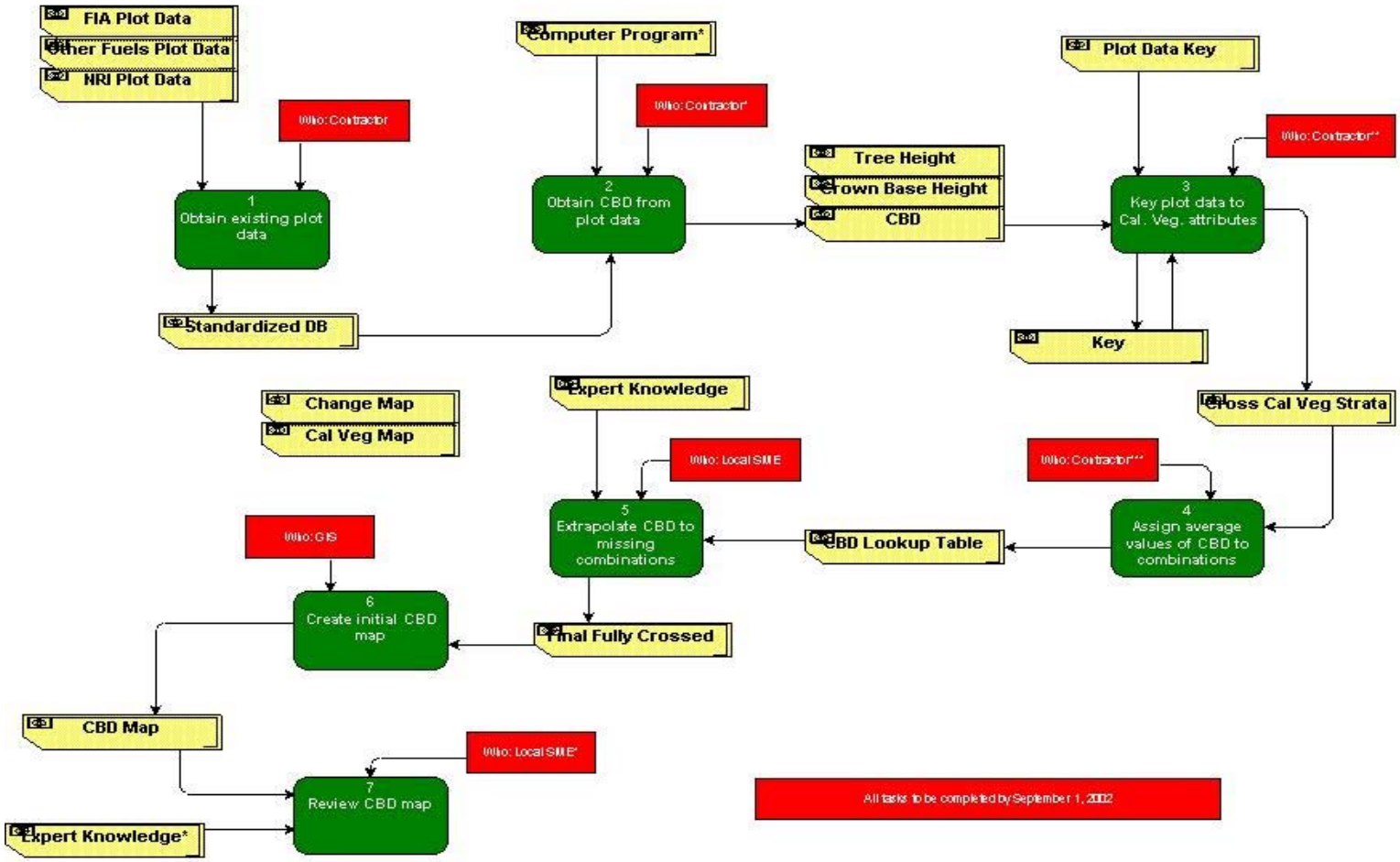

Figure 7 – Proposed High-level Business Process Flow Model for Revising Canopy Fuel